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THE IMPACT OF FOREIGN AID ON ECONOMIC GROWTH IN ARAB COUNTRIES USING PANEL DATA MODEL

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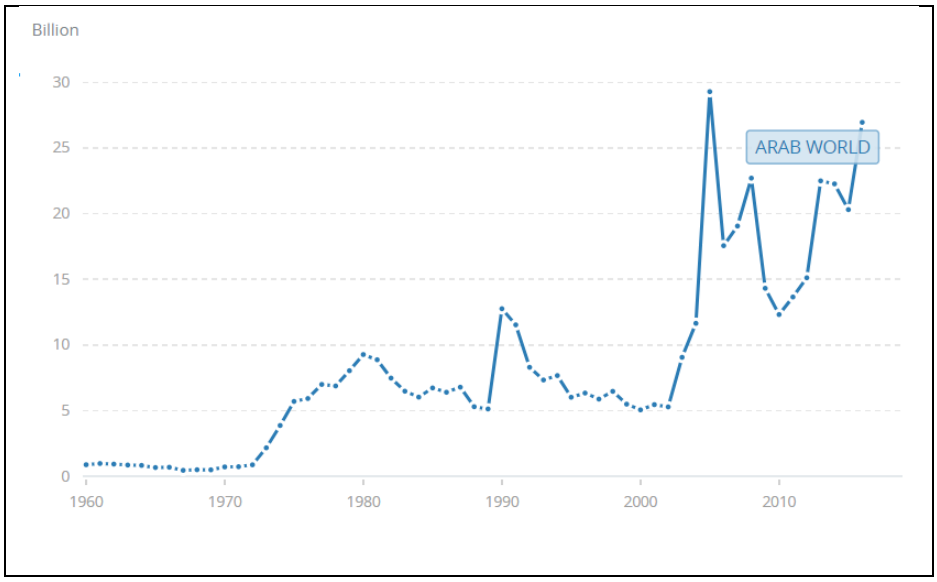
CHAPTER 1
INTRODUCTION

The role of foreign aid in helping poor countries is ambiguous. Studies have showed three different views of effective of foreign aid. First, several studies argue that the foreign aid contributes to economic growth. Second, other studies find that foreign aid fails to increase economic growth rates in developing countries [Easterly and Pfutze (2008), Dalgaard et al. (2004)]. Third, many studies conclude that foreign aid helps if the right environment is present such as good fiscal, monetary, and trade policies [Burnside and Dollar (2000)].

The importance of foreign aid to the economic growth in developing country comes from its ability to increase the domestic capital stock and capital goods by increasing financial resources and foreign exchange for recipients [Bandyopadhyay et al. (2015)]. The question about aid is not about the existence of bad projects or programs, but whether aid does or does not contribute to overall economic growth and human development [Addison et al. (2005)].

More than $ 4.6 trillion (constant 2007 dollars) has been given to recipient countries during the last five decades [Askarov and Doucouliagos (2015)]. However, studies found that many recipients are still ranked among the poorest countries in the world such as Sub-Saharan African countries (SSA) [Adedokun (2017)].

The data of World Bank shows that Arab countries have received a significant proportion of foreign aid during the past decade. where it was about 16.5% of the net official development assistance in 2006 increased to reach about 17.1% of the net official development assistance in 2016.



Source: World Bank Data

Fig. 1 – Net official development assistance received (current US$) of Arab World

In this paper, and by employing the system generalized methods of moments (system GMM) technique, we will examine the underlying premise that foreign aid is effective for Arab countries. The paper examines a sample of six Arab countries; Egypt, Jordan, Sudan, Tunisia, Algeria and Morocco over the period 1995-2015.

CHAPTER 2
LITERATURE REVIEW

The question whether foreign aid benefits or harms growth is still unanswered. The earlier literature support the idea that foreign assistance is important in particularly for developing economies by increasing savings and foreign-exchange rate to capital formation and economic growth. On the other hand, recent research found that aid either decrease or did not impact economic growth. Studies like Easterly and Pfutze (2010) and Ang (2010) have shown that foreign aid might exhibit a negative effect on output expansion. By looking at the impact of foreign aid on Indian economy, Ang (2010) shows that the rate of growth of Indian GDP negatively influenced by foreign aid. However, he found a positive indirect effect by financial liberalization. Kosack (2003) examined the effectiveness of aid on the economic growth under the condition that the government has effective institutions. The model utilized the quality-of-life growth, aid receipts relative to GDP and the level of democratization as the main variables. He estimated the equation by using ordinary least squares (OLS) and then he estimated the equation by using two-stage least squares (2SLS) to avoid correlation between variables. He found that aid increases the growth in quality of life if the country governed by a democracy. There are many factors play different roles in the effectiveness of foreign aid. Easterly (2003) introduced political determinants of aid as tools to solve issues arising from giving aids such as terms for aid, and he used economic variables such as inflation, budget deficits, index of openness to trade in and policy index like budget deficits. The results showed that even in the appropriate policy environment the aid might not work. He points out that aid agencies most of time do not evaluate projects after completion that leads, for example, World Bank be unaware of the results of the aid where The World Bank reviewed only 5% of its loans after three to ten years.

Other studies looking at the impact of time to judge on the relationship between foreign aid and rate of growth. Clemens, Radelet, Bhavnani and Bazzi (2012) focused in their study on time factor where they distinguished between the effect of aggregate aid on the current growth and aids that might take a long time to contribute the economic growth. Also, they look at validity of instrumental variables since the current growth affects the current aid, that need a strategy to avoid correlation. They found in short term expanding in aid usually followed by increasing in growth, and that is necessary but not sufficient condition to explain that aid increase growth. Bruckner (2013) ran fixed effect regression for real per capita GDP growth and foreign aid for 47 least developed countries over 1960-2000 by using two-stage least squares (2SLS). He found that the foreign aid is positively affected on the economic growth in case of economic growth has a quantitatively large negative reverse effect on foreign aid. Also, he found foreign aid has a positive effect on per capita GDP growth after large negative response of foreign aid to economic growth.

Headey (2008) studied the effect of number and political views of donors on the effectiveness of foreign aid to recipients by using a panel data method for 56 developing countries over 4-year period spanning over 1970-2001. He took the period of Cold War into consideration which had strong effect on bilateral aid and funds that came from multilateral sources such as World Bank and International Monetary Fund. Although bilateral aid expanded in the 1990s, he found multilateral aid is more effective in promoting growth especially during the Cold War where bilateral aid was ineffective. Also, he found that there is political motivation for the aid, regardless of the effectiveness of that aid, from both multilateral and bilateral aids even though multilateral aids came from international financial institution such as World Bank but the volume of contributions of aids from donors give big donors a main role to influence the conditions of aid to recipients. Moreira (2005) examined the relationship between economic growth and foreign aid for 48 countries by using panel

data approach over 1970–1998. This paper used time dummies in the regressions to correct for the world business cycle. The results show that there is an empirical evidence emphasize that the contradiction of getting benefits in the micro from foreign aid and getting positive, negative, or even neutral effect in the macro, which is called “micro-macro paradox”, should be given less importance as an overall appraisal of the effectiveness of foreign aid. The paradox is mainly due to the methods rather than the theoretical models used for such analysis. Also, the paper states that aid is less effective in short run than in the long run. The author suggests that non-linearity, that is, negative effects of high aid inflows, time-lags, country heterogeneity, and foreign aid-endogeneity issues should not be ignored while analyzing the influence of foreign aid on economic growth of the developing countries.

CHAPTER 3
METHODOLOGY

This paper adds to the voluminous literature on foreign aid and its role in the economic growth two things. First, the paper focused on some Arab countries where it received an important proportion of the official development assistance. Second, this paper took into the consideration the effect of the Arab uprising in 2011 on the economic growth. It focused on the transition group of economies such as Egypt, Tunisia and Morocco.

We specify and apply the panel data method to our economic growth model for some Arab countries, Egypt, Jordan, Algeria, Morocco Sudan and Tunisia from 1995 to 2015. This method is commonly used in growth and foreign aid literature and can be found in the works of Headey (2008), Hansen and Trap (2001), Moreira (2005) and many others. The panel data is based on dynamic model which have been used in wide range of micro and macroeconomics applications such as Euler equations for household consumption, adjustment cost models for firms' factor demand and empirical models of economic growth. It has become standard practice to use the Generalized Method of Moments (GMM), which produce consistent parameter estimates for a finite number of time periods, T, and a large cross-sectional dimension [Bun and Vasilis (2013)].

Burnside and Dollar (2000) and Boone (1994) found that endogeneity bias existed in the economic growth model due to aid which leads to inconsistent estimates and incorrect findings [Ullah et al. (2018)]. Endogeneity refers to situations in which an independent variable is correlated with the error term, or if two error terms correlate when dealing with structural equation modelling. In this model, endogeneity occurs possibly due to difficulty of considering aid as a lump-sum transfer, independent of the level of income. Also, there the aid-growth model may be biased due to heterogeneity across countries and time. By

definition, independent variables are said heterogeneous if all parameters (constant and slope coefficients) vary across individuals [Adedokun (2017)].

Many empirical studies such as Burnside and Dollar (2000) and Kosack (2006) employ either OLS or two-stage least squares method to examine aid-growth model. However, Hansen and Trap (2001), Subramanian (2008) and others used the generalized method of moments (GMM) to avoid the issues of endogeneity and heterogeneity. Hansen and Trap (2001) provide the evidence that the method used in aid-growth model is matter in order to get reliable results. Therefore, we adopt the system GMM estimator, proposed by Arellano and Bond (1991) and Blundell and Bond (1998). The system GMM is a method that depends on first differencing and using lagged values of endogenous variables as instruments. especially if the variables are close to a random walk. The system GMM reduces finite sample bias by using additional moment conditions where the autoregressive parameter is only weakly identified from the first-differenced equation [Adedokun (2017)].

We choose some explanatory variables that were used in most influential published aid-growth literatures with adding the effect of Arab uprising in 2011 as a control variable since all countries in this model are affected by Arab Spring. The dependent variable is the growth rate of GDP. The first explanatory variable D is a dummy variable that takes a value of 1 from 2011 to 2015 due to Arab Spring. The next variables are FA/GDP is net official development assistance as a percentage of GDP, FI/GDP refers to foreign investment as a percentage of GDP, GDP/CAP is growth rate of GDP per capita, Inflation refers to annual rate of inflation. M2LG is lagged broad money as a percentage of GDP and T/GDP is a trade as a percentage of GDP. We intended to add corruption as a control variable but, for our data, it began from 1995 where data was not available for all countries we studied. The data was extract from World Bank's website. Table 1 offers descriptive statistics for key variables.

Table 1. Summary statistics

	Mean	Median	Max.	Min.	Std. Dev.	Sum Sq. Dev	Obs.
D	0.25	0	1	0	0.434828	22.5	120
FA/GDP	1.63634	1.04987	9.14206	0.085906	1.579032	296.7078	120
FI/GDP	4.203975	3.0305	23.537	-0.243	4.35841	2260.493	120
GDP/CAP	2.597417	2.432	12.815	-3.025	2.599702	804.2556	120
GDPGR	4.4378	4.1305	12.373	-1.968	2.396897	683.6686	120
INFLATION	7.86156	4.499388	132.8238	-11.19	14.09931	23656.08	120
M2LG	1.329194	0.757661	19.019	-11.2557	4.78868	2728.844	120
T/GDP	859.1382	65.553	94783	17.85861	8646.143	0.00000001	120

Following Burnside and Dollar (2006), this paper applied the equation (1).

$$Y_{it} = \alpha + \beta_i X_{it} + \gamma_i Z_{it} + \varepsilon^{\gamma}_{it}$$

where Y is the growth rate of GDP, X is a vector of variables, Z is a vector of control variables, ε is the error term, *i* refers to country, t refers to time and β and γ are the estimated parameters.

CHAPTER 4
THE EMPIRICAL RESULTS

Table 2 presents estimates from regressions with random effect. Column 1 reports the results of the regression of economic growth and foreign aid as a percentage of GDP. Then, we add dummy variable of Arab Spring, GDP per capita and foreign investment as a percentage of GDP to the foreign aid to get the results in column 2, 3 and 4 respectively. Finally, we add, separately, trade as a percentage of GDP, lagged of broad money and Inflation rate to the equation to see what the effect of these variable on the model is, the results are shown in column 5, 6 and 7 respectively.

Table 2. Impact of foreign aid on growth, GMM estimations using Random effect

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
C	4.265085*	4.64090*	2.5692*	2.429*	2.431*	2.8161*	2.382*
	(10.326)	(12.834)	(9.111)	(8.260)	(8.2258)	(8.031)	(7.669)
FA/GDP	0.061884	0.15033	0.2904*	0.2431**	0.2429**	0.18256	0.2452**
	(0.416)	(0.999)	(3.0420)	(2.4416)	(2.4295)	(1.635)	(2.4524)
D		-2.1833*	-1.256*	-1.1583*	-1.1658*	-1.3713*	-1.161*
	-	(-4.2187)	(-3.501)	(-3.1983)	(-3.1635)	(-3.737)	(-3.196)
GDP/CAP			0.6487*	0.635*	0.635*	0.5665*	0.6305*
	-	-	(11.387)	(11.0838)	(11.0173)	(9.268)	(10.827)
FI/GDP				0.0566	0.0566	0.0706***	0.6305
	-	-	-	(1.5688)	(1.5618)	(1.8777)	(1.6274)
T/GDP					0.0000021		
	-	-	-	-	(0.1252)	-	-
M2						-0.0771**	
	-	-	-	-	-	(-2.458)	-
Inflation							0.0049
	-	-	-	-	-	-	(0.6304)
Observation	120	120	120	120	120	120	120
R-squared	0.0013	0.1267	0.5825	0.5908	0.5909	0.5762	0.5916

Standard errors are displayed in parentheses under the coefficients. *, **, *** Denote significance at 1%, 5% and 10%, respectively. Random time effect and random cross-section effects included in all estimates.

The most statistically significant variable for growth is the effect of Arab uprising; no doubt that Arab Spring have a negative effect on growth in this region. Also, GDP per capita is statistically significant but its effect is positive on growth due to increase of productivity where the data of the Conference Board (2018) shows that the output per employed person for those country increased over the period of study. For instance, for Tunisia the output per

employed person increased about 32.8% between 1995–2015. Also, this percentage increased by 22.1%, 153%, 62.8% and 6.7% for Egypt, Morocco, Sudan and Algeria respectively. It is obvious from column 1 that foreign aid is not statistically significant, that means countries in this model are not heavily dependent upon foreign aid for supplementing their economic growth. Also, Foreign investment was insignificant in the column 3 when it is added to the equation. However, in the column 6 when we add the lagged of broad money it turns to be significant which refers that foreign aid may be beneficial in expanding economic growth if policy maker used the right monetary policy, but we noticed that the foreign aid variable in column 6 is insignificant which refers that monetary policy has a positive effect on economic growth, but it affects the effectiveness of foreign aid.

In the column 5, the results show that the variable of trade as a percentage of GDP is insignificant, but the foreign aid is significant at 5% level of significance. Also, the results show in the column 7 that inflation is insignificant while foreign aid in both columns is significant.

In summary, the results on foreign aid and economic growth showed that aid had a significant positive relationship with economic growth. All these result by using a random effect. The paper tried to use the fixed effect to exam aid-growth model, but it was difficult due the use of a dummy variable as an explanatory variable.

The paper used the same model but instead of using random effect it used without random and fixed effect. However, there results were same except the column 7 where foreign aid was significant when we add lagged of broad money to the variables FA/GDP, D and GDP/CAP. Table 3 presents estimates from regressions without fixed and random effect.

Table 3. Impact of foreign aid on growth, GMM estimations without fixed and Random effect

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
C	4.2360*	4.5932*	2.5692*	2.429*	2.431*	2.8098*	2.382*
	(13.064)	(14.668)	(9.111)	(8.260)	(8.2258)	(8.928)	(7.669)
FA/GDP	0.07973	0.1825	0.2904*	0.2431**	0.2429**	0.2122**	0.2452**
	(0.556)	(1.3428)	(3.0420)	(2.4416)	(2.4295)	(2.13870)	(2.4524)
D		-2.2036*	-1.256*	-1.1584*	-1.1658*	-1.412*	-1.161*
	-	(-4.4127)	(-3.501)	(-3.1983)	(-3.1635)	(-3.8597)	(-3.196)
GDP/CAP			0.6487*	0.635*	0.635*	0.559*	0.6305*
	-	-	(11.387)	(11.0838)	(11.0173)	(9.3446)	(10.827)
FI/GDP				0.0566	0.0566	0.0684***	0.6305
	-	-	-	(1.5688)	(1.5618)	(1.899)	(1.6274)
T/GDP					0.0000021		
	-	-	-	-	(0.1252)	-	-
M2						-0.0802**	
	-	-	-	-	-	(-2.57)	-
Inflation							0.0049
	-	-	-	-	-	-	(0.6304)
Observation	120	120	120	120	120	120	120
R-squared	0.0023	0.1388	0.5825	0.5908	0.5909	0.581	0.5916

Standard errors are displayed in parentheses under the coefficients. *, **, *** Denote significance at 1%, 5% and 10%, respectively. Without random and time effect included in all estimates.

CHAPTER 5
CONCLUSION

The role of foreign aid in the economic growth of developing countries have been a topic of intense debate. Using the system generalized methods of moments (system GMM) technique, we examine foreign aid effectiveness in 6 Arab countries, Egypt, Jordan, Sudan, Tunisia, Algeria and Morocco over the period 1995-2015.

Overall, we found that foreign aid has a positive effect on growth in these Arab countries, but that does not mean growth is dependent mainly on foreign aid. Also, we found that foreign aid with monetary policy will not be significant due to the negative effect of the expanding of monetary policy on growth rate of GDP in this model. The results show that inflation and trade variable are not significant but both policies effective with foreign aid in increase the rate growth of GDP.

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APPENDICES

APPENDIX A

Dataset of Egypt

Year	FA/GDP	GDPgr	T/GDP	Inflation	M2 %GDP	GDPcap	FI%GDP	D
1995	1.915556815	4.642	50.24509804	15.7422305	79.78740196	2.641	0.0994	0
1996	1.973909132	4.989	46.94856146	7.187103697	78.64145597	3.018	0.94	0
1997	1.713432836	5.491	43.73824746	4.625605788	75.15475743	3.549	1.135	0
1998	1.618165423	4.036	41.927627	3.872575464	77.0256437	2.142	1.268	0
1999	1.251641814	6.105	38.36150845	3.079499126	76.04336801	4.175	1.174	0
2000	1.005279366	5.368	39.0179359	2.683805353	76.74189944	3.44	1.237	0
2001	0.920679887	3.535	39.81042654	2.269757205	82.37828269	1.615	0.522	0
2002	0.905569007	2.37	40.98706783	2.73723855	87.8365004	0.448	0.736	0
2003	0.681772474	3.192	46.17964072	4.507776363	96.6788503	1.251	0.286	0
2004	0.967991241	4.09	57.81990521	11.27061933	96.67862586	2.157	1.59	0
2005	0.644843105	4.479	62.95264624	4.869396969	97.13784245	2.579	5.994	0
2006	0.524493682	6.854	61.51853651	7.644526445	97.38731171	4.966	9.344	0
2007	0.613685345	7.09	65.07787325	9.318969058	96.20641406	5.235	8.874	0
2008	0.849298537	7.158	71.68062535	18.31683168	88.40425157	5.282	5.831	0
2009	0.471684519	4.674	56.55344464	11.76349544	83.1559012	2.756	3.551	0
2010	0.273653433	5.145	47.93635007	11.26518827	80.74556173	3.092	2.917	0
2011	0.190119357	1.78	45.25563416	10.0539169	75.79391193	-0.341	-0.205	1
2012	0.796048299	2.216	40.71176927	7.11815562	69.71545906	-0.014	1.001	1
2013	2.370672974	2.185	40.37303806	9.42157654	74.61183576	-0.084	1.453	1
2014	1.488180365	2.916	36.92018779	10.14580055	75.44264838	0.668	1.51	1
2015	1.008800258	4.372	34.84594296	10.35748965	77.98587789	2.184	2.082	1

APPENDIX B

Dataset of Jordan

Year	FA/GDP	GDPgr	T/GDP	Inflation	M2 %GDP	GDPcap	FI%GDP	D
1995	4.40924308	6.186	124.5854734	2.353124513	101.592892	2.077	0.198	0
1996	4.071348584	2.087	131.0429364	6.501218027	96.6187966	-1.018	0.224	0
1997	3.682254568	3.308	120.7312917	3.037884203	99.44057551	0.83	4.981	0
1998	3.112313938	2.994	109.0516234	3.091666667	96.81967584	0.995	3.918	0
1999	3.16225647	3.409	104.4809297	0.606256568	108.5782649	1.616	1.938	0
2000	3.794979079	4.245	110.3336702	0.666880926	112.5553642	2.443	10.794	0
2001	2.983106989	5.269	109.2843778	1.772204374	114.6904707	3.437	3.049	0
2002	3.523702173	5.784	114.1234407	1.83299389	116.6571621	3.904	2.486	0
2003	7.942042927	4.161	115.7064591	1.63	127.8574703	2.052	5.365	0
2004	3.344777938	8.567	135.0010836	3.361868215	126.1868632	5.845	8.209	0
2005	3.630498233	8.147	147.5390857	3.493685346	138.8810632	4.768	15.764	0
2006	2.719090478	8.093	142.3417613	6.251724667	131.0188397	4.084	23.537	0
2007	2.763180942	8.176	146.622735	5.386824032	129.6189358	3.653	15.325	0
2008	2.997917262	7.232	145.3083305	14.92781501	122.1120453	2.331	12.865	0
2009	2.866656342	5.477	115.5308673	-0.67817812	139.9373321	0.354	10.13	0
2010	3.612866604	2.311	117.2858824	5.013941643	137.7761074	-2.835	6.389	0
2011	3.593271607	2.587	121.5139027	4.158333333	129.6453848	-2.73	5.153	1
2012	4.157682909	2.651	120.5114368	4.520361629	118.3896517	-2.713	5.005	1
2013	4.892538878	2.829	114.3058195	4.830067361	124.4608492	-2.315	5.795	1
2014	9.142062981	3.096	113.0713817	2.891566265	125.2776391	-1.536	6.08	1
2015	7.124412368	2.392	98.07690674	-0.87289759	125.9363854	-1.521	4.265	1

APPENDIX C

Dataset of Morocco

Year	FA/GDP	GDPgr	T/GDP	Inflation	M2 %GDP	GDPcap	FI%GDP	D
1995	1.063545008	-5.405	51.71502538	6.123581648	55.95726695	-6.847	0.198	0
1996	1.228896073	12.373	47.09554345	2.986809228	52.84019288	10.777	0.224	0
1997	0.905756045	-1.561	51.15015465	1.038198951	61.92703291	-2.871	4.981	0
1998	0.951357547	7.239	50.79768215	2.753113308	60.99491224	5.883	3.918	0
1999	1.208185684	1.081	53.98669265	0.684782609	66.14431678	-0.157	1.938	0
2000	0.777816412	1.913	59.16182679	1.894634568	70.90966796	0.681	10.794	0
2001	0.799935202	7.32	59.4180039	0.619801875	77.53607872	6.03	3.049	0
2002	0.572442936	3.121	60.5340864	2.795619669	81.95504512	1.889	2.486	0
2003	0.86639388	5.961	58.32774268	1.167733675	82.55115719	4.701	5.365	0
2004	1.104304893	4.797	61.59653347	1.493444034	84.32495509	3.561	8.209	0
2005	1.003369217	3.292	67.91485449	0.98264166	92.01915556	2.082	15.764	0
2006	1.403017379	7.575	71.49628678	3.28476167	99.47292281	6.328	23.537	0
2007	1.499034666	3.532	78.48717434	2.042085127	109.0197031	2.335	15.325	0
2008	1.686886864	5.923	85.6728209	3.707317073	111.5692397	4.677	12.865	0
2009	1.164927443	4.244	67.91510295	0.994825964	114.3586281	2.964	10.13	0
2010	1.056674212	3.816	75.24763454	0.987355331	113.667906	2.471	6.389	0
2011	1.467785173	5.246	83.42680017	0.92236032	115.7558458	3.805	5.153	1
2012	1.455570948	3.01	85.12491729	1.278741213	117.0183036	1.539	5.005	1
2013	1.90168776	4.535	80.02055856	1.88750188	113.9090961	3.013	5.795	1
2014	2.486562238	2.669	81.17703227	0.435456491	117.5957222	1.186	6.08	1
2015	1.897740701	4.55	76.37919291	1.557907113	116.8816816	3.08	4.265	1

APPENDIX D

Dataset of Sudan

Year	FA/GDP	GDPgr	T/GDP	Inflation	M2 %GDP	GDPcap	FI%GDP	D
1995	0.933763373	5.997	14.77246695	68.37519295	8.599488445	3.19	0.087	0
1996	0.809907535	5.919	23.2061102	132.8237774	10.14342317	3.078	0.004	0
1997	0.466514409	10.567	17.85861324	46.65032277	8.578547427	7.567	0.838	0
1998	0.712238787	4.309	21.87513604	17.10505647	9.081722832	1.452	3.295	0
1999	0.769182724	3.104	24.71436749	15.99474583	9.389563534	0.264	3.471	0
2000	0.661586351	6.346	29.40423446	8.033055445	10.9997435	3.407	3.2	0
2001	0.530123804	6.5	24.19332776	4.871466645	12.65691219	3.547	4.354	0
2002	0.789937302	6.427	31.39638942	8.33381706	14.44447448	3.472	4.818	0
2003	1.491474882	7.735	31.99763154	7.710690832	15.66788618	4.757	7.646	0
2004	2.302421408	3.883	37.79031548	8.418006386	16.97168036	1.048	7.042	0
2005	3.932547972	7.49	47.58002131	8.516734349	20.84636655	4.606	5.888	0
2006	4.007357257	10.064	45.7449141	7.196736744	22.89040077	7.168	5.142	0
2007	3.721379068	11.522	44.55307091	7.976023489	21.31417946	8.637	3.278	0
2008	4.176296345	7.802	43.68505192	14.30651248	20.13365339	5.046	3.032	0
2009	3.707849227	3.242	35.96704522	11.24854637	23.22085032	0.614	3.248	0
2010	3.086814761	3.469	36.97560936	13.24539414	23.69812647	0.835	3.144	0
2011	2.707365215	-1.968	33.11167174	22.11212074	23.51822327	7.889	2.576	1
2012	2.116639352	0.522	24.72100078	37.39336493	24.13591894	12.815	3.393	1
2013	2.231898224	4.395	23.72850804	29.95860642	19.37865402	1.959	2.342	1
2014	1.262079908	2.679	19.45883426	36.90776377	16.49014821	0.263	1.523	1
2015	1.237161595	4.906	19.10080411	16.91179225	16.11535395	2.436	1.779	1

APPENDIX E

Dataset of Tunisia

Year	FA/GDP	GDPgr	T/GDP	Inflation	M2 %GDP	GDPcap	FI%GDP	D
1995	0.338325514	2.352	93.714	6.244	45.761	0.584	1.466	0
1996	0.534691815	7.146	85.72	3.725	46.389	5.502	1.217	0
1997	0.778598523	5.441	80.501	3.652	44.913	4.001	1.634	0
1998	0.575391533	4.784	79.979	3.125	43.763	3.513	2.981	0
1999	0.909058244	6.055	77.905	2.69	47.457	4.902	1.525	0
2000	0.765218585	4.71	82.456	2.962	50.085	3.679	3.496	0
2001	1.209957354	3.796	89.552	1.983	54.965	2.879	2.046	0
2002	0.708016575	1.323	85.342	2.721	54.684	0.515	3.415	0
2003	0.941103147	4.702	82.39	2.713	53.273	3.909	1.965	0
2004	0.979730721	6.236	86.948	3.632	52.477	5.409	1.899	0
2005	1.0430839	3.487	90.251	2.018	54.114	2.617	2.208	0
2006	1.176945866	5.244	93.938	4.491	55.344	4.278	9.424	0
2007	0.822795992	6.71	104.075	3.417	57.587	5.653	3.895	0
2008	0.917675545	4.238	115.396	4.921	58.875	3.144	5.798	0
2009	1.160796109	3.043	90.904	3.525	62.582	1.922	3.51	0
2010	1.248552814	3.511	96.029	4.416	65.083	2.362	3.029	0
2011	2.140906356	-1.917	101.125	3.544	69.728	-3.025	0.944	1
2012	2.274446967	3.998	94783	5.138	69.074	2.802	3.451	1
2013	1.546748583	2.876	90.334	5.799	68.708	1.681	2.289	1
2014	1.939116368	2.971	81.5	4.938	68.985	1.776	2.153	1
2015	0.986541497	1.154	74.084	4.857	69.398	-0.011	2.249	1

APPENDIX F

Dataset of Algeria

Year	FA/GDP	GDPgr	T/GDP	Inflation	M2 %GDP	GDPcap	FI%GDP	D
1995	0.317359807	3.8	55.191	28.577	37.169	1.853	0.0212	0
1996	0.316397752	4.1	53.705	24.022	33.006	2.305	0.575	0
1997	0.252799249	1.1	52.244	7.002	36.081	-0.508	0.54	0
1998	0.407420704	5.1	45.094	-3.131	42.377	3.545	1.259	0
1999	0.129746806	3.2	50.929	10.856	42.208	1.758	0.599	0
2000	0.181120046	3.82	62.858	22.655	37.83	2.428	0.511	0
2001	0.174863292	3.008	58.706	-0.482	56.849	1.676	2.033	0
2002	0.154920667	5.609	61.134	1.311	62.724	4.279	1.876	0
2003	0.185747455	7.202	62.125	8.329	62.819	5.851	0.94	0
2004	0.236008845	4.302	65.701	12.246	59.265	2.943	1.034	0
2005	0.244214493	5.908	71.279	16.117	53.828	4.453	1.12	0
2006	0.209946968	1.684	70.73	10.564	57.284	0.211	1.573	0
2007	0.264166338	3.373	71.938	6.423	64.094	1.799	1.25	0
2008	0.21220991	2.36	76.685	15.355	62.986	0.714	1.543	0
2009	0.194344086	1.632	71.324	-11.19	73.161	-0.102	2.002	0
2010	0.124870508	3.634	69.867	16.082	69.055	1.764	1.427	0
2011	0.116658327	2.892	67.472	18.241	68.06	0.93	1.285	1
2012	0.085905743	3.375	65.405	7.481	67.954	1.321	0.718	1
2013	0.115429142	2.768	63.611	-0.062	71.73	0.696	0.807	1
2014	0.088031538	3.789	62.146	-0.29	79.309	1.733	0.703	1
2015	0.461079611	3.763	59.733	-6.572	82.053	1.79	-0.243	1

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